STUDIES ON THE LIMESTONE VEGETATION OF SAHASRADHARA NEAR DEHRA DUN (U.P.)—3. PHYTOSOCIOLOGICAL STUDIES: SYNTHETIC CHARACTERS OF VEGETATION

INTRODUCTION

A general account of the vegetation of Sahasradhara area, including physiography and environmental factors is being published elsewhere. In the present paper its synthetic characters have been analysed.

MATERIALS AND METHODS

In the vegetation of Sahasradhara the following stands were recognised *i.e.* vegetation on the (1) Top of the hillocks (2) Calcareous slopes (3) Non-calcareous slopes (4) Ravines and (5) Base of the hillocks. In the first four cases, the stands were further subdivided into two associations, East and West facing. The synthetic characters given are mainly those advocated by Braum Blanquet (1932), Cain (1932) and Pandeya et al. (1968). These include presence, constance and fidelity.

Constance has been determined from the frequency data in the following manner:

Constance 1 = 1% to 20% frequency
—do— 2 = 21% to 40% frequency
—do— 3 = 41% to 60% frequency
—do— 4 = 61% to 80% frequency
—do— 5 = 81% to 100% frequency

Fidelity shows the degree with which a species is restricted or otherwise to a particular association.

According to Hanson (1950) it is a measure of ecological amplitude of a species and Anderson (1949) used it as an expression of the completeness with which a given species is identified with a plant society. According to Oosting (1956) and Braun Blanquet (1932) fidelity values can be divided into the following five classes:

Fidelity-1	Strangers appearing accidently	Accidentals
-do- 2	*Indifferent species*, without profound affinity for any one community	Companions
-do- 3	*Preferential species*, present in several communities with greater or lesser abundance but predominant in any one of them	Characteristic species
-do- 4	*Selective species*, found specially in one community but met with occasionally in others	Characteristic species
-do- 5	*Exclusive species*, completely or almost confined to one community	Characteristic species

DISCUSSION

Fidelity has been adopted as a measure of the ecological amplitude of a species. A perusal of the data given in Table above shows that *Shorea robusta* Gaertn. and *Xeromphis spinosa* (Thunb.) Keay have a very narrow ecological amplitude but high fidelity. *Adhatoda vasica* Nees, *Micromeria biflora* Benth. and *Rumex hastatus* D. Don are the selective species in the area. *Acacia catechu* Willd., *Ageratum conyzoides* Linn., *Bauhinia retusa* Roxb., *Bombax ceiba* Linn., *Carissa spinarum* Linn., *Cassia tora* Linn., *Cocculus laurifolius* DC., *Colebrookea oppositifolia* Sm., *Erythrina suberosa* Roxb., *Mallotus philippensis* (Lamk.) Muell.-Arg., *Murraya koenigii* (Linn.) Spreng., *Nyctanthes arbor-tristis* Linn., *Sapium insigne* Benth., *Sida cordata* (Burm. f.) Borss., *Toona ciliata* Roem., *Triumfetta rhomboidea* Jacq. and *Xanthium strumarium* Linn. are the preferential species.

The present studies show that the vegetation of the Sahasradhara area in general consists of characteristic species belonging to fidelity class 3. At the same time interesting correlation can be deduced from these studies. Some species exclusively grow on the calcareous slopes and do not grow anywhere else in the area. It is obvious that these are highly specialised calcicoles and are unable to grow on calcium deficient substrata. However, most of the species of the area occur on non-calcareous slopes also. Several species are confined to the ravines and the base. A few species have very narrow ecological amplitude, while the majority of the species occur extensively and therefore, possess wide ecological amplitude.

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ON THE OCCURRENCE OF *GALINSOGA CILIATA* (RAFIN.) BLAKE (ASTERACEAE) IN SOUTH INDIA

Babu (1969), recorded the occurrence of *Galinsoga ciliata* (Rafin.) Blake, a South American weed, now naturalised in England (Butcher, 1961), Nepal (Kitamura, in Hara, 1966) and elsewhere (Salisbury, 1961), for the first time in India. His collections are from Dehra Dun and Mussoorie in Uttar Pradesh and as far as is known it has not yet been collected from any where else in India. Recently, this species was seen to be growing in abundance at Yercaud, Salem District in Tamilnadu, as a weed in waste places and along the road sides and was collected by the author. This collection from a place far from its original place of collection in India is intersting and suggests the possibility of a very wide range of its distribution in this country.

The plant can easily be distinguished from *Galinsoga parviflora* Cav., to which it is closely allied and with which it often grows at Yercaud, in being markedly hispid hairy with longer and wider ray florets (upto 0.6 cm x 0.2 cm) the ends of which almost touch each other, and in the paleae being not three lobed. In *G. parviflora* Cav., the plants are glabrescent, the ray florets very small (upto 0.4 cm x 0.1 cm) and widely spaced on the head, and the paleae are three lobed.

Galinsoga ciliata (Rafin.) Blake in Rhodora 24: 35, 1922; Babu in Bull. Bot. Surv. India 11 (1 & 2): 184-185. 1969.

Specimen examined: Salem, Yercaud, ± 1350 m., 10th November, 1970—*D. S. Pandey* 29400, (MH).

For the detailed description reference may be made to Babu (l.c. 1969).

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CAYRATIA ANEMONIFOLIA (ZIPPEL EX MIQ.) SUSSENG. (VITACEAE)—A NEW ADDITION TO THE FLORA OF INDIA

While examining the specimens of Madras Herbarium the author met with some interesting specimens which are kept under the name *Cayratia pedata* (Laws.) Juss., but the leaf-shape readily distinguishes those from the materials of above mentioned species. After critical studies of the said specimens, the author came to the conclusion that these represent *Cayratia anemonifolia* (Zippel ex Miq.) Susseng. hitherto known from Timor. This particular species has been reported from Island of Timor by Miquel (*Ann. Mus. Bot. Ludg.* Batav. 1: 80. 1864) but its occurrence elsewhere has not yet been reported. Planchon (*DC. Monog. Phaner.* 5: 560. 1887) included it under *Cissus* Planch., subgenus *Cayratia* Planch. Sussenguth [Engl. Pflanzenfam. (Reprint ed. 2) 20d: 280. 1953] placed the